



#10

SEQUENCE LISTING

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Kuberasampath, Thangavel
Rueger, David
Ozkaynak, Engin

<120> Osteogenic Devices

<130> STK-008CN

<140> US 09/754,831

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<151> 1995-01-20

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<150> US 07/995,345

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<150> US 07/315,342

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<170> PatentIn version 3.0

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Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr
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Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val
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35 40 45

Val Asn Ser Val Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr
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Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val
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20 25 30

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Gln Xaa Xaa
35 40 45

Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Pro
50 55 60

Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa
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Xaa Cys Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala
35 40 45

Xaa Xaa Gln Xaa Xaa Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa
50 55 60

Xaa Cys Cys Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa
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 20 25 30

 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala Xaa Xaa Gln Xaa Xaa
 35 40 45

 Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Pro
 50 55 60

 Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa Xaa Xaa Xaa Xaa Xaa
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 <223> wherein Xaa at position 44 is a serine, an alanine or a proline

<220>
 <221> misc_feature
 <222> (45)..(45)
 <223> wherein Xaa at position 45 is a threonine or a serine

<220>
 <221> misc_feature
 <222> (49)..(49)
 <223> wherein Xaa at position 49 is an isoleucine, a valine or a threonine

<220>
 <221> misc_feature
 <222> (50)..(50)
 <223> wherein Xaa at position 50 is a valine, an isoleucine or a leucine

<220>
 <221> misc_feature
 <222> (52)..(52)
 <223> wherein Xaa at position 52 is a threonine or a serine

<220>
 <221> misc_feature
 <222> (53)..(53)
 <223> wherein Xaa at position 53 is a leucine or a isoleucine

<220>
 <221> misc_feature
 <222> (55)..(55)
 <223> wherein Xaa at position 55 is an asparagine, a histidine or an
 arginine

<220>
 <221> misc_feature
 <222> (56)..(56)
 <223> wherein Xaa at position 56 is a serine, an alanine, a phenylalanine
 or an asparagine

<220>
 <221> misc_feature
 <222> (57)..(57)
 <223> wherein Xaa at position 57 is a valine or an isoleucine

<220>
 <221> misc_feature

<222> (59)..(59)
 <223> wherein Xaa at position 59 is a serine or a proline

 <220>
 <221> misc_feature
 <222> (60)..(60)
 <223> wherein Xaa at position 60 is a glycine or a glutamic acid

 <220>
 <221> misc_feature
 <222> (61)..(61)
 <223> wherein Xaa at position 61 is a lysine, a glutamine, a threonine
 or a serine

 <220>
 <221> misc_feature
 <222> (62)..(62)
 <223> wherein Xaa at position 62 is an isoleucine or a valine

 <220>
 <221> misc_feature
 <222> (64)..(64)
 <223> wherein Xaa at position 64 is a lysine or a glutamic acid

 <220>
 <221> misc_feature
 <222> (65)..(65)
 <223> wherein Xaa at position 65 is an alanine, a proline or a serine

 <220>
 <221> misc_feature
 <222> (68)..(68)
 <223> wherein Xaa at position 68 is a valine or an alanine

 <220>
 <221> misc_feature
 <222> (70)..(70)
 <223> wherein Xaa at position 70 is a threonine or a glutamic acid

 <220>
 <221> misc_feature
 <222> (71)..(71)
 <223> wherein Xaa at position 71 is a glutamic acid, a glutamine or a
 lysine

 <220>
 <221> misc_feature
 <222> (72)..(72)
 <223> wherein Xaa at position 72 is a leucine or a methionine

 <220>
 <221> misc_feature
 <222> (73)..(73)
 <223> wherein Xaa at position 73 is a serine, an asparagine or an
 aspartic acid

 <220>

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<221> misc_feature
<222> (74)..(74)
<223> wherein Xaa at position 74 is an alanine, a serine or a proline

<220>
<221> misc_feature
<222> (75)..(75)
<223> wherein Xaa at position 75 is an isoleucine, a leucine or a valine

<220>
<221> misc_feature
<222> (76)..(76)
<223> wherein Xaa at position 76 is a serine or an alanine

<220>
<221> misc_feature
<222> (77)..(77)
<223> wherein Xaa at position 77 is a methionine, a valine or an isoleucine

<220>
<221> misc_feature
<222> (79)..(79)
<223> wherein Xaa at position 79 is a phenylalanine or a tyrosine

<220>
<221> misc_feature
<222> (80)..(80)
<223> wherein Xaa at position 80 is a leucine, a tyrosine or a phenylalanine

<220>
<221> misc_feature
<222> (81)..(81)
<223> wherein Xaa at position 81 is an aspartic acid or an asparagine

<220>
<221> misc_feature
<222> (82)..(82)
<223> wherein Xaa at position 82 is a glutamic acid, an asparagine or an
aspartic acid

<220>
<221> misc_feature
<222> (83)..(83)
<223> wherein Xaa at position 83 is a glutamine or an asparagine

<220>
<221> misc_feature
<222> (84)..(84)
<223> wherein Xaa at position 84 is a glutamic acid, a glutamine, a serine
or a lysine

<220>
<221> misc_feature
<222> (85)..(85)
<223> wherein Xaa at position 85 is an asparagine or a lysine

<220>

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<221> misc_feature
<222> (87)..(87)
<223> wherein Xaa at position 87 is a valine or an isoleucine

<220>
<221> misc_feature
<222> (89)..(89)
<223> wherein Xaa at position 89 is a lysine or an arginine

<220>
<221> misc_feature
<222> (90)..(90)
<223> wherein Xaa at position 90 is an asparagine, a lysine or a histidine

<220>
<221> misc_feature
<222> (92)..(92)
<223> wherein Xaa at position 92 is a glutamine, a glutamic acid, an
      arginine or a proline

<220>
<221> misc_feature
<222> (93)..(93)
<223> wherein Xaa at position 93 is an aspartic acid, a glutamic acid or
      an asparagine

<220>
<221> misc_feature
<222> (95)..(95)
<223> wherein Xaa at position 95 is a valine or a threonine

<220>
<221> misc_feature
<222> (97)..(97)
<223> wherein Xaa at position 97 is a glutamic acid, an aspartic acid or
      an arginine

<220>
<221> misc_feature
<222> (98)..(98)
<223> wherein Xaa at position 98 is a glycine, an alanine, a serine or
      a glutamic acid

<220>
<221> misc_feature
<222> (100)..(100)
<223> wherein Xaa at position 100 is a glycine or a histidine

<220>
<221> misc_feature
<222> (102)..(102)
<223> wherein Xaa at position 102 is a an arginine or a histidine

<400> 6

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Cys Xaa Arg Xaa Xaa Leu Xaa Val Xaa Phe Xaa Asp Xaa Gly Trp Xaa
1           5           10           15

```

Xaa Trp Xaa Xaa Xaa Pro Xaa Gly Xaa Xaa Ala Xaa Tyr Cys Xaa Gly
 20 25 30
 Xaa Cys Xaa Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Asn His Ala
 35 40 45
 Xaa Xaa Gln Xaa Xaa Val Xaa Xaa Xaa Asn Xaa Xaa Xaa Xaa Pro Xaa
 50 55 60
 Xaa Cys Cys Xaa Pro Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Leu Xaa Xaa
 65 70 75 80
 Xaa Xaa Xaa Xaa Xaa Val Xaa Leu Xaa Xaa Tyr Xaa Xaa Met Xaa Val
 85 90 95
 Xaa Xaa Cys Xaa Cys Xaa
 100

<210> 7
 <211> 102
 <212> PRT
 <213> Xenopus sp.

<220>
 <223> Vg1 protein sequence with osteogenic activity

<400> 7

Cys Lys Lys Arg His Leu Tyr Val Glu Phe Lys Asp Val Gly Trp Gln
 1 5 10 15
 Asn Trp Val Ile Ala Pro Gln Gly Tyr Met Ala Asn Tyr Cys Tyr Gly
 20 25 30
 Glu Cys Pro Tyr Pro Leu Thr Glu Ile Leu Asn Gly Ser Asn His Ala
 35 40 45
 Ile Leu Gln Thr Leu Val His Ser Ile Glu Pro Glu Asp Ile Pro Leu
 50 55 60
 Pro Cys Cys Val Pro Thr Lys Met Ser Pro Ile Ser Met Leu Phe Tyr
 65 70 75 80
 Asp Asn Asn Asp Asn Val Val Leu Arg His Tyr Glu Asn Met Ala Val
 85 90 95
 Asp Glu Cys Gly Cys Arg
 100

<210> 8
 <211> 102
 <212> PRT
 <213> Drosophila sp.

<220>
 <223> DPP protein sequence with osteogenic activity

<400> 8

Cys Arg Arg His Ser Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp
1 5 10 15
Asp Trp Ile Val Ala Pro Leu Gly Tyr Asp Ala Tyr Tyr Cys His Gly
20 25 30
Lys Cys Pro Phe Pro Leu Ala Asp His Phe Asn Ser Thr Asn His Ala
35 40 45
Val Val Gln Thr Leu Val Asn Asn Asn Asn Pro Gly Lys Val Pro Lys
50 55 60
Ala Cys Cys Val Pro Thr Gln Leu Asp Ser Val Ala Met Leu Tyr Leu
65 70 75 80
Asn Asp Gln Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val
85 90 95
Val Gly Cys Gly Cys Arg
100

<210> 9

<211> 107

<212> PRT

<213> mammalian

<220>

<223> OP1 protein sequence with osteogenic activity

<400> 9

His Gln Arg Gln Ala Cys Lys Lys His Glu Leu Tyr Val Ser Phe Arg
1 5 10 15
Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala Pro Glu Gly Tyr Ala Ala
20 25 30
Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro Leu Asn Ser Tyr Met Asn
35 40 45
Ala Thr Asn His Ala Ile Val Gln Thr Leu Val His Phe Ile Asn Pro
50 55 60
Glu Thr Val Pro Lys Pro Cys Cys Ala Pro Thr Gln Leu Asn Ala Ile
65 70 75 80
Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn Val Ile Leu Lys Lys Tyr
85 90 95
Arg Asn Met Val Val Arg Ala Cys Gly Cys His
100 105

<210> 10

<211> 103

<212> PRT
<213> mammalian

<220>

<223> CBP-2a protein sequence with osteogenic activity

<400> 10

Cys	Lys	Arg	His	Pro	Leu	Tyr	Val	Asp	Phe	Ser	Asp	Val	Gly	Trp	Asn	
1				5					10					15		
Asp	Trp	Ile	Val	Ala	Pro	Pro	Gly	Tyr	His	Ala	Phe	Tyr	Cys	His	Gly	
			20					25					30			
Glu	Cys	Pro	Phe	Pro	Leu	Ala	Asp	His	Leu	Asn	Ser	Thr	Asn	His	Ala	
		35					40					45				
Ile	Val	Gln	Thr	Leu	Val	Asn	Ser	Val	Asn	Ser	Lys	Ile	Pro	Lys	Ala	
	50					55					60					
Cys	Cys	Val	Pro	Thr	Glu	Leu	Ser	Ala	Ile	Ser	Met	Leu	Tyr	Leu	Tyr	
65					70				75					80		
Leu	Asp	Glu	Asn	Glu	Lys	Val	Val	Leu	Lys	Asn	Tyr	Gln	Asp	Met	Val	
			85					90						95		
Val	Glu	Gly	Cys	Gly	Cys	Arg										
			100													

<210> 11
<211> 100
<212> PRT
<213> mammalian

<220>

<223> CBMP-2b protein sequence with osteogenic activity

<400> 11

Cys	Arg	Arg	His	Ser	Leu	Tyr	Val	Asp	Phe	Ser	Asp	Val	Gly	Trp	Asn	
1				5					10					15		
Asp	Trp	Ile	Val	Ala	Pro	Pro	Gly	Tyr	Gln	Ala	Phe	Tyr	Cys	His	Gly	
			20					25					30			
Asp	Cys	Pro	Phe	Pro	Leu	Ala	Asp	His	Leu	Asn	Ser	Thr	Asn	His	Ala	
		35					40					45				
Ile	Val	Gln	Thr	Leu	Val	Asn	Ser	Val	Asn	Ser	Ile	Pro	Lys	Ala	Cys	
	50					55					60					
Cys	Val	Pro	Thr	Glu	Leu	Ser	Ala	Ile	Ser	Met	Leu	Tyr	Leu	Asp	Glu	
65				70				75						80		
Tyr	Asp	Lys	Val	Val	Leu	Lys	Asn	Tyr	Gln	Glu	Met	Val	Val	Glu	Gly	
			85					90						95		

Cys Gly Cys Arg
100

<210> 12
<211> 103
<212> PRT
<213> mammalian

<220>
<223> CBMP-3 protein sequence with osteogenic activity

<400> 12

Cys	Ala	Arg	Arg	Tyr	Leu	Lys	Val	Asp	Phe	Ala	Asp	Ile	Gly	Trp	Ser
1				5					10					15	
Glu	Trp	Ile	Ile	Ser	Pro	Lys	Ser	Phe	Asp	Ala	Tyr	Tyr	Cys	Ser	Gly
		20						25					30		
Ala	Cys	Gln	Phe	Pro	Met	Pro	Lys	Ser	Leu	Lys	Pro	Ser	Asn	His	Ala
		35					40					45			
Thr	Ile	Gln	Ser	Ile	Val	Arg	Ala	Val	Gly	Val	Val	Pro	Gly	Ile	Pro
	50					55					60				
Glu	Pro	Cys	Cys	Val	Pro	Glu	Lys	Met	Ser	Ser	Leu	Ser	Ile	Leu	Phe
65					70					75					80
Phe	Asp	Glu	Asn	Lys	Asn	Val	Val	Leu	Lys	Val	Tyr	Pro	Asn	Met	Thr
			85						90					95	
Val	Glu	Ser	Cys	Ala	Cys	Arg									
			100												

<210> 13
<211> 98
<212> PRT
<213> Artificial Sequence

<220>
<223> Biosynthetic COP1 protein with osteogenic activity

<400> 13

Leu	Tyr	Val	Asp	Phe	Gln	Arg	Asp	Val	Gly	Trp	Asp	Asp	Trp	Ile	Ile
1				5					10					15	
Ala	Pro	Val	Asp	Phe	Asp	Ala	Tyr	Tyr	Cys	Ser	Gly	Ala	Cys	Gln	Phe
		20						25					30		
Pro	Ser	Ala	Asp	His	Phe	Asn	Ser	Thr	Asn	His	Ala	Val	Val	Gln	Thr
		35					40					45			
Leu	Val	Asn	Asn	Met	Asn	Pro	Gly	Lys	Val	Pro	Lys	Pro	Cys	Cys	Val
	50					55					60				
Pro	Thr	Glu	Leu	Ser	Ala	Ile	Ser	Met	Leu	Tyr	Leu	Asp	Glu	Asn	Ser

65		70		75		80									
Thr	Val	Val	Leu	Lys	Asn	Tyr	Gln	Glu	Met	Thr	Val	Val	Gly	Cys	Gly
			85						90					95	

Cys Arg

<210> 14
 <211> 98
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Biosynthetic COP3 protein with osteogenic activity

<400> 14

Leu	Tyr	Val	Asp	Phe	Gln	Arg	Asp	Val	Gly	Trp	Asp	Asp	Trp	Ile	Val
1				5					10					15	
Ala	Pro	Pro	Gly	Tyr	Gln	Ala	Phe	Tyr	Cys	Ser	Gly	Ala	Cys	Gln	Phe
			20					25					30		
Pro	Ser	Ala	Asp	His	Phe	Asn	Ser	Thr	Asn	His	Ala	Val	Val	Gln	Thr
		35					40					45			
Leu	Val	Asn	Asn	Met	Asn	Pro	Gly	Lys	Val	Pro	Lys	Pro	Cys	Cys	Val
	50					55					60				
Pro	Thr	Glu	Leu	Ser	Ala	Ile	Ser	Met	Leu	Tyr	Leu	Asp	Glu	Asn	Glu
65					70				75					80	
Lys	Val	Val	Leu	Lys	Asn	Tyr	Gln	Glu	Met	Val	Val	Glu	Gly	Cys	Gly
			85						90					95	

Cys Arg

<210> 15
 <211> 97
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Biosynthetic COP4 protein with osteogenic activity

<400> 15

Leu	Tyr	Val	Asp	Phe	Ser	Asp	Val	Gly	Trp	Asp	Asp	Trp	Ile	Val	Ala
1				5				10					15		
Pro	Pro	Gly	Tyr	Gln	Ala	Phe	Tyr	Cys	Ser	Gly	Ala	Cys	Gln	Phe	Pro
		20						25				30			
Ser	Ala	Asp	His	Phe	Asn	Ser	Thr	Asn	His	Ala	Val	Val	Gln	Thr	Leu
		35					40					45			

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
 50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
 65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
 85 90 95

Arg

<210> 16
 <211> 97
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Biosynthetic COP16 protein with osteogenic activity

<400> 16

Leu Tyr Val Asp Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala
 1 5 10 15

Pro Pro Gly Tyr Gln Ala Phe Tyr Cys Ser Gly Ala Cys Gln Phe Pro
 20 25 30

Ser Ala Asp His Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu
 35 40 45

Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys Pro Cys Cys Val Pro
 50 55 60

Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys
 65 70 75 80

Val Val Leu Lys Asn Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys
 85 90 95

Arg

<210> 17
 <211> 17
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> peptide fragment

<400> 17

Ser Phe Asp Ala Tyr Tyr Cys Ser Gly Ala Cys Gln Phe Pro Met Pro
 1 5 10 15

Lys

<210> 18
<211> 14
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 18

Ser Leu Lys Pro Ser Asn Tyr Ala Thr Ile Gln Ser Ile Val
1 5 10

<210> 19
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 19

Ala Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu
1 5 10 15

Asp Glu Asn Glu Lys
20

<210> 20
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 20

Met Ser Ser Leu Ser Ile Leu Phe Phe Asp Glu Asn Lys
1 5 10

<210> 21
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 21

Ser Gln Glu Leu Tyr Val Asp Phe Gln Arg
1 5 10

<210> 22
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 22

Phe Leu His Cys Gln Phe Ser Glu Arg Asn Ser
1 5 10

<210> 23
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 23

Thr Val Gly Gln Leu Asn Glu Gln Ser Ser Glu Pro Asn Ile Tyr
1 5 10 15

<210> 24
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 24

Leu Tyr Asp Pro Met Val Val
1 5

<210> 25
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 25

Val Gly Val Val Pro Gly Ile Pro Glu Pro Cys Cys Val Pro Glu
1 5 10 15

<210> 26
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 26

Val Asp Phe Ala Asp Ile Gly
1 5

<210> 27
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 27

Val Pro Lys Pro Cys Cys Ala Pro Thr
1 5

<210> 28
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 28

Ile Asn Ile Ala Asn Tyr Leu
1 5

<210> 29
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 29

Asp Asn His Val Leu Thr Met Phe Pro Ile Ala Ile Asn
1 5 10

<210> 30
<211> 16
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>

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<221> misc_feature
<222> (15)..(15)
<223> wherein Xaa at position 15 is any amino acid

<400> 30

Asp Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Xaa Pro
1          5          10          15

<210> 31
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (4)..(4)
<223> wherein Xaa at position 4 is any.amino acid

<220>
<221> misc_feature
<222> (10)..(10)
<223> wherein Xaa at position 10 is any amino acid

<400> 31

Asp Ile Gly Xaa Ser Glu Trp Ile Ile Xaa Pro
1          5          10

<210> 32
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (15)..(16)
<223> wherein Xaa at positions 15 and 16 is any amino acid

<400> 32

Ser Ile Val Arg Ala Val Gly Val Pro Gly Ile Pro Glu Pro Xaa Xaa
1          5          10          15

Val

<210> 33
<211> 13
<212> PRT
<213> Artificial Sequence

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<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (2)..(2)
<223> wherein Xaa at position 2 is any amino acid

<400> 33

Asp Xaa Ile Val Ala Pro Pro Gln Tyr His Ala Phe Tyr
1 5 10

<210> 34
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<400> 34

Asp Glu Asn Lys Asn Val Val Leu Lys Val Tyr Pro Asn Met Thr Val
1 5 10 15

Glu

<210> 35
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (13)..(13)
<223> wherein Xaa at position 13 is any amino acid

<220>
<221> misc_feature
<222> (16)..(16)
<223> wherein Xaa at position 16 is any amino acid

<400> 35

Ser Gln Thr Leu Gln Phe Asp Glu Gln Thr Leu Lys Xaa Ala Arg Xaa
1 5 10 15

Lys Gln

<210> 36
<211> 24

<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (19)..(19)
<223> wherein Xaa at position 19 is any amino acid

<400> 36

Asp Glu Gln Thr Leu Lys Lys Ala Arg Arg Lys Gln Trp Ile Glu Pro
1 5 10 15

Arg Asn Xaa Ala Arg Arg Tyr Leu
20

<210> 37
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

<220>
<221> misc_feature
<222> (12)..(12)
<223> wherein Xaa at position 12 is any amino acid

<220>
<221> misc_feature
<222> (14)..(14)
<223> wherein Xaa at position 14 is any amino acid

<220>
<221> misc_feature
<222> (17)..(18)
<223> wherein Xaa at positions 17-18 is any amino acid

<400> 37

Ala Arg Arg Lys Gln Trp Ile Glu Pro Arg Asn Xaa Ala Xaa Arg Tyr
1 5 10 15

Xaa Xaa Val Asp
20

<210> 38
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> peptide fragment

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<220>
<221> misc_feature
<222> (2)..(2)
<223> wherein Xaa at position 2 is any amino acid

<220>
<221> misc_feature
<222> (8)..(8)
<223> wherein Xaa at position 8 is any amino acid

<220>
<221> misc_feature
<222> (10)..(10)
<223> wherein Xaa at position 10 is any amino acid

<220>
<221> misc_feature
<222> (12)..(13)
<223> wherein Xaa at positions 12-13 is any amino acid

<220>
<221> misc_feature
<222> (19)..(19)
<223> wherein Xaa at position 19 is any amino acid

<220>
<221> misc_feature
<222> (21)..(22)
<223> wherein Xaa at positions 21-22 is any amino acid

<400> 38

Arg Xaa Gln Trp Ile Glu Pro Xaa Asn Xaa Ala Xaa Xaa Tyr Leu Lys
1 5 10 15

Val Asp Xaa Ala Xaa Xaa Gly
20

<210> 39
<211> 97
<212> PRT
<213> mammalian

<220>
<223> OP1 shorter sequence capable of inducing endochondral bone formation

<400> 39

Leu Tyr Val Ser Phe Arg Asp Leu Gly Trp Gln Asp Trp Ile Ile Ala
1 5 10 15

Pro Glu Gly Tyr Ala Ala Tyr Tyr Cys Glu Gly Glu Cys Ala Phe Pro
20 25 30

Leu Asn Ser Tyr Met Asn Ala Thr Asn His Ala Ile Val Gln Thr Leu
35 40 45

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Val His Phe Ile Asn Pro Glu Thr Val Pro Lys Pro Cys Cys Ala Pro
50 55 60

Thr Gln Leu Asn Ala Ile Ser Val Leu Tyr Phe Asp Asp Ser Ser Asn
65 70 75 80

Val Ile Leu Lys Lys Tyr Arg Asn Met Val Val Arg Ala Cys Gly Cys
85 90 95

His

<210> 40
<211> 4805
<212> DNA
<213> mammalian

<220>
<223> genomic sequence of OP1

<220>
<221> misc_feature
<223> approximately 1000 bases are missing between position 1883 and 188

<400> 40
ggaggtatag gagctctctt cgatttttagc aaaccaggag tccgaagatc taaggagagc 60
tggggggtttg actccgagag ctcgagcagt ccccaagacc tgggtcttgac tcacgagtta 120
gactccactc agaggctgac tgtctccagg gtctacacct ctaagggcga cactgggctc 180
aagcagactg ccgttttcta tatgggatga gccttcacag ggcagccagt tgggatgggt 240
tgagggtttgg ctgtagacat cagaaaccca agtcaaagtc gcttcaacca gtagaaaatt 300
caccagcccg cagagctaag gttgggtgga cattaggggt ggttgatcca ggagctcaac 360
agtgtcctct gagccccagc tccttctgcc ccacccacc atcttcagtg ctgcttcctc 420
tcaaggccac agctgtagtt ggccaggggg gcttcattat tttttgctcc tgggcagtag 480
gaggaagaga atgaatgtct ctccatgggt ctttcttagg aatgtgggaa ctttttccag 540
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gaggggcatt gcagggtggag gaaacggcac atgcaagagc cctgcgtggg agtgagcttg 780
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ctaggaaaaa agcaatccct ctgttggtggg gtggaaggaa ggttgagtg tgtgtgagag	960
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tccga		4805

<210> 41
 <211> 314
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> consensus probe for OP1

<400> 41	
gacctaagt ggctgtacgt ggacttccag	cgcgacgtgg gctgggacga ctggatcatc 60
gccccgtcg acttcgacgc ctactactgc	tccggagcct gccagttccc ctctgcggat 120
cacttcaaca gcaccaacca cgccgtgggtg	cagaccctgg tgaacaacat gaaccccggc 180
aaggtagcca agccctgctg cgtgccacc	gagctgtccg ccatcagcat gctgtacctg 240
gacgagaatt ccaccgtggg gctgaagaac	taccaggaga tgaccgtggg gggctgcggc 300
tgccgctaac tgca	314

<210> 42
 <211> 314
 <212> DNA
 <213> mammalian

<220>
 <223> OP1

<400> 42	
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tacatgaacg ccaccaacca cgccatcgtg	cagacgctgg tccacttcat caacccggaa 180
acggtgcccc agccctgctg tgcgccacg	cagctcaatg ccatctccgt cctctacttc 240

gatgacagct ccaacgtcat cctgaagaaa tacagaaaca tgggtgggccg ggcctgtggc 300
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<210> 43
 <211> 315
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> CDS
 <222> (1)..(306)
 <223> COPO

<400> 43
 gat cct aat ggg ctg tac gtg gac ttc cag cgc gac gtg ggc tgg gac 48
 Asp Pro Asn Gly Leu Tyr Val Asp Phe Gln Arg Asp Val Gly Trp Asp
 1 5 10 15
 gac tgg atc atc gcc ccc gtc gac ttc gac gcc tac tac tgc tcc gga 96
 Asp Trp Ile Ile Ala Pro Val Asp Phe Asp Ala Tyr Tyr Cys Ser Gly
 20 25 30
 gcc tgc cag ttc ccc tct gcg gat cac ttc aac agc acc aac cac gcc 144
 Ala Cys Gln Phe Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala
 35 40 45
 gtg gtg cag acc ctg gtg aac aac atg aac ccc ggc aag gta ccc aag 192
 Val Val Gln Thr Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys
 50 55 60
 ccc tgc tgc gtg ccc acc gag ctg tcc gcc atc agc atg ctg tac ctg 240
 Pro Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu
 65 70 75 80
 gac gag aat tcc acc gtg gtg ctg aag aac tac cag gag atg acc gtg 288
 Asp Glu Asn Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val
 85 90 95
 gtg ggc tgc ggc tgc cgc taactgcag 315
 Val Gly Cys Gly Cys Arg
 100

<210> 44
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> COPO

<400> 44

Asp Pro Asn Gly Leu Tyr Val Asp Phe Gln Arg Asp Val Gly Trp Asp

1	5	10	15
Asp Trp Ile Ile Ala Pro Val Asp Phe Asp Ala Tyr Tyr Cys Ser Gly	20	25	30
Ala Cys Gln Phe Pro Ser Ala Asp His Phe Asn Ser Thr Asn His Ala	35	40	45
Val Val Gln Thr Leu Val Asn Asn Met Asn Pro Gly Lys Val Pro Lys	50	55	60
Pro Cys Cys Val Pro Thr Glu Leu Ser Ala Ile Ser Met Leu Tyr Leu	65	70	75
Asp Glu Asn Ser Thr Val Val Leu Lys Asn Tyr Gln Glu Met Thr Val	85	90	95
Val Gly Cys Gly Cys Arg	100		

<210> 45
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Hinge region

<400> 45

Asp Pro Asn Gly
 1

<210> 46
 <211> 106
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> beta-inhibin-a

<400> 46

Cys Cys Lys Lys Gln Phe Phe Val Ser Phe Lys Asp Ile Gly Trp Asn	5	10	15
1			

Asp Trp Ile Ile Ala Pro Ser Gly Tyr His Ala Asn Tyr Cys Glu Gly	20	25	30
---	----	----	----

Glu Cys Pro Ser His Ile Ala Gly Thr Ser Gly Ser Ser Leu Ser Phe

35	40	45
His Ser Thr Val Ile Asn His Tyr Arg Met Arg Gly His Ser Pro Phe		
50	55	60
Ala Asn Leu Lys Ser Cys Cys Val Pro Thr Lys Leu Arg Pro Met Ser		
65	70	75
Met Leu Tyr Tyr Asp Asp Gly Gln Asn Ile Ile Lys Lys Asp Ile Gln		
	85	90
		95
Asn Met Ile Val Glu Glu Cys Gly Cys Ser		
	100	105

<210> 47
 <211> 105
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> beta-inhibin-b

<400> 47

Cys Cys Arg Gln Gln Phe Phe Ile Asp Phe Arg Ile Gly Trp Asn Asp
1 5 10 15
Trp Ile Ile Ala Pro Thr Gly Tyr Tyr Gly Asn Tyr Cys Glu Gly Ser
20 25 30
Cys Pro Ala Tyr Leu Ala Gly Val Pro Gly Ser Ala Ser Ser Phe His
35 40 45
Thr Ala Val Val Asn Gln Tyr Arg Met Arg Gly Leu Asn Pro Gly Thr
50 55 60
Lys Val Asn Ser Cys Cys Ile Pro Thr Lys Leu Ser Thr Met Ser Met
65 70 75 80
Leu Tyr Phe Asp Asp Glu Tyr Asn Ile Val Lys Arg Asp Val Pro Asn
85 90 95
Met Ile Val Glu Glu Cys Gly Cys Ala
100 105

<210> 48
 <211> 99
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> TGF-beta-1

<400> 48

Cys Cys Val Arg Gln Leu Tyr Ile Asp Phe Arg Lys Asp Leu Gly Trp
1 5 10 15

Lys Trp Ile His Glu Pro Lys Gly Tyr His Ala Asn Phe Cys Leu Gly
 20 25 30
 Pro Cys Pro Tyr Ile Trp Ser Leu Leu Asp Thr Gln Tyr Ser Lys Val
 35 40 45
 Leu Ala Leu Tyr Asn Gln His Asn Pro Gly Ala Ser Ala Ala Pro Cys
 50 55 60
 Cys Val Pro Gln Ala Leu Glu Pro Leu Pro Ile Val Tyr Tyr Val Gly
 65 70 75 80
 Arg Lys Pro Lys Val Glu Gln Leu Ser Asn Met Ile Val Arg Ser Cys
 85 90 95
 Lys Cys Ser

<210> 49
 <211> 99
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> TGF-beta-2

<400> 49

Cys Cys Leu Arg Pro Leu Tyr Ile Asp Phe Lys Arg Asp Leu Gly Trp
 1 5 10 15
 Lys Trp Ile His Glu Pro Lys Gly Tyr Asn Ala Asn Phe Cys Ala Gly
 20 25 30
 Ala Cys Pro Tyr Leu Trp Ser Leu Ser Asp Thr Gln His Ser Arg Val
 35 40 45
 Leu Ser Leu Tyr Asn Thr Ile Asn Pro Glu Ala Ser Ala Ser Pro Cys
 50 55 60
 Cys Val Ser Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Ile Gly
 65 70 75 80
 Lys Thr Pro Lys Ile Glu Gln Leu Ser Asn Met Ile Val Lys Ser Cys
 85 90 95

Lys Cys Ser

<210> 50
 <211> 99
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> TGF-beta-3

<400> 50

Cys Cys Val Arg Pro Leu Tyr Ile Asp Phe Arg Gln Asp Leu Gly Trp
1 5 10 15
Lys Trp Val His Glu Pro Lys Gly Tyr Tyr Ala Asn Phe Cys Ser Gly
20 25 30
Pro Cys Pro Tyr Leu Arg Ser Leu Ala Asp Thr Thr His Ser Thr Val
35 40 45
Leu Gly Leu Tyr Asn Thr Leu Asn Pro Glu Ala Ser Ala Ser Pro Cys
50 55 60
Cys Val Pro Gln Asp Leu Glu Pro Leu Thr Ile Leu Tyr Tyr Val Gly
65 70 75 80
Arg Thr Pro Lys Val Glu Gln Leu Ser Asn Met Val Val Lys Ser Cys
85 90 95

Lys Cys Ser

<210> 51

<211> 99

<212> PRT

<213> Artificial Sequence

<220>

<223> MIS

<400> 51

Cys Ala Leu Arg Glu Leu Ser Val Asp Leu Arg Ala Glu Arg Ser Val
1 5 10 15
Leu Ile Pro Glu Thr Tyr Gln Ala Asn Asn Cys Gln Gly Val Cys Gly
20 25 30
Trp Pro Gln Ser Asp Arg Asn Pro Arg Tyr Gly Asn His Val Val Leu
35 40 45
Leu Leu Lys Met Gln Ala Arg Gly Ala Ala Leu Ala Arg Pro Pro Cys
50 55 60
Cys Val Pro Thr Ala Tyr Ala Gly Lys Leu Leu Ile Ser Leu Ser Glu
65 70 75 80
Glu Arg Ile Ser Ala His His Val Pro Asn Met Val Ala Thr Glu Cys
85 90 95

Gly Cys Arg

<210> 52

<211> 103

<212> PRT
 <213> Artificial Sequence

 <220>
 <223> Alpha-inhibin

 <220>
 <221> misc_feature
 <222> (93)..(93)
 <223> wherein Xaa at position 93 is a threonine, a valine or a proline

 <400> 52

Cys	His	Arg	Val	Ala	Leu	Asn	Ile	Ser	Phe	Gln	Glu	Leu	Gly	Trp	Glu	
1				5					10					15		
Arg	Trp	Ile	Val	Tyr	Pro	Pro	Ser	Phe	Ile	Phe	His	Tyr	Cys	His	Gly	
			20					25					30			
Gly	Cys	Gly	Leu	His	Ile	Pro	Pro	Asn	Leu	Ser	Leu	Pro	Val	Pro	Gly	
		35					40					45				
Ala	Pro	Pro	Thr	Pro	Ala	Gln	Pro	Tyr	Ser	Leu	Leu	Pro	Gly	Ala	Gln	
	50					55					60					
Pro	Cys	Cys	Ala	Ala	Leu	Pro	Gly	Thr	Met	Arg	Pro	Leu	His	Val	Arg	
65					70				75					80		
Thr	Thr	Ser	Asp	Gly	Gly	Tyr	Ser	Phe	Lys	Tyr	Glu	Xaa	Asn	Leu	Leu	
			85						90					95		
Thr	Gln	His	Cys	Ala	Cys	Ile										
			100													

<210> 53
 <211> 861
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> CDS
 <222> (1)..(852)
 <223> COP-5 fusion protein

<400> 53																
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Met	Lys	Ala	Ile	Phe	Val	Leu	Lys	Gly	Ser	Leu	Asp	Arg	Asp	Leu	Asp	
1				5				10					15			
tct	cgt	ctg	gat	ctg	gac	gtt	cgt	acc	gac	cac	aaa	gac	ctg	tct	gat	96
Ser	Arg	Leu	Asp	Leu	Asp	Val	Arg	Thr	Asp	His	Lys	Asp	Leu	Ser	Asp	
			20					25					30			
cac	ctg	gtt	ctg	gtc	gac	ctg	gct	cgt	aac	gac	ctg	gct	cgt	atc	gtt	144
His	Leu	Val	Leu	Val	Asp	Leu	Ala	Arg	Asn	Asp	Leu	Ala	Arg	Ile	Val	
			35				40					45				

act ccc ggg tct cgt tac gtt gcg gat ctg gaa ttc atg gct gac aac Thr Pro Gly Ser Arg Tyr Val Ala Asp Leu Glu Phe Met Ala Asp Asn 50 55 60	192
aaa ttc aac aag gaa cag cag aac gcg ttc tac gag atc ttg cac ctg Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu 65 70 75 80	240
ccg aac ctg aac gaa gag cag cgt aac ggc ttc atc caa agc ttg aag Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys 85 90 95	288
gat gag ccc tct cag tct gcg aat ctg cta gcg gat gcc aag aaa ctg Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys Leu 100 105 110	336
aac gat gcg cag gca ccg aaa tcg gat cag ggg caa ttc atg gct gac Asn Asp Ala Gln Ala Pro Lys Ser Asp Gln Gly Gln Phe Met Ala Asp 115 120 125	384
aac aaa ttc aac aag gaa cag cag aac gcg ttc tac gag atc ttg cac Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His 130 135 140	432
ctg ccg aac ctg aac gaa gag cag cgt aac ggc ttc atc caa agc ttg Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu 145 150 155 160	480
aag gat gag ccc tct cag tct gcg aat ctg cta gcg gat gcc aag aaa Lys Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys 165 170 175	528
ctg aac gat gcg cag gca ccg aag gat cct aat ggg ctg tac gtc gac Leu Asn Asp Ala Gln Ala Pro Lys Asp Pro Asn Gly Leu Tyr Val Asp 180 185 190	576
ttc agc gac gtg ggc tgg gac gac tgg att gtg gcc cca cca ggc tac Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Pro Gly Tyr 195 200 205	624
cag gcc ttc tac tgc cat ggc gaa tgc cct ttc ccg cta gcg gat cac Gln Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His 210 215 220	672
ttc aac agc acc aac cac gcc gtg gtg cag acc ctg gtg aac tct gtc Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn Ser Val 225 230 235 240	720
aac tcc aag atc cct aag gct tgc tgc gtg ccc acc gag ctg tcc gcc Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala 245 250 255	768
atc agc atg ctg tac ctg gac gag aat gag aag gtg gtg ctg aag aac Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn 260 265 270	816
tac cag gag atg gta gta gag ggc tgc ggc tgc cgc taactgcag	861

Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
 275 280

<210> 54
 <211> 284
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> COP-5 fusion protein

<400> 54

Met Lys Ala Ile Phe Val Leu Lys Gly Ser Leu Asp Arg Asp Leu Asp
 1 5 10 15

Ser Arg Leu Asp Leu Asp Val Arg Thr Asp His Lys Asp Leu Ser Asp
 20 25 30

His Leu Val Leu Val Asp Leu Ala Arg Asn Asp Leu Ala Arg Ile Val
 35 40 45

Thr Pro Gly Ser Arg Tyr Val Ala Asp Leu Glu Phe Met Ala Asp Asn
 50 55 60

Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His Leu
 65 70 75 80

Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu Lys
 85 90 95

Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys Leu
 100 105 110

Asn Asp Ala Gln Ala Pro Lys Ser Asp Gln Gly Gln Phe Met Ala Asp
 115 120 125

Asn Lys Phe Asn Lys Glu Gln Gln Asn Ala Phe Tyr Glu Ile Leu His
 130 135 140

Leu Pro Asn Leu Asn Glu Glu Gln Arg Asn Gly Phe Ile Gln Ser Leu
 145 150 155 160

Lys Asp Glu Pro Ser Gln Ser Ala Asn Leu Leu Ala Asp Ala Lys Lys
 165 170 175

Leu Asn Asp Ala Gln Ala Pro Lys Asp Pro Asn Gly Leu Tyr Val Asp
180 185 190

Phe Ser Asp Val Gly Trp Asp Asp Trp Ile Val Ala Pro Pro Gly Tyr
195 200 205

Gln Ala Phe Tyr Cys His Gly Glu Cys Pro Phe Pro Leu Ala Asp His
210 215 220

Phe Asn Ser Thr Asn His Ala Val Val Gln Thr Leu Val Asn Ser Val
225 230 235 240

Asn Ser Lys Ile Pro Lys Ala Cys Cys Val Pro Thr Glu Leu Ser Ala
245 250 255

Ile Ser Met Leu Tyr Leu Asp Glu Asn Glu Lys Val Val Leu Lys Asn
260 265 270

Tyr Gln Glu Met Val Val Glu Gly Cys Gly Cys Arg
275 280

<210> 55
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> BOP

<400> 55

Ser Phe Asp Ala Tyr Tyr Cys Ser Gly Ala Cys Gln Phe Pro Ser
1 5 10 15

<210> 56
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> DPP

<400> 56

Gly Tyr Asp Ala Tyr Tyr Cys His Gly Lys Cys Pro Phe Phe Leu
1 5 10 15

<210> 57
<211> 15

<212> PRT
<213> Artificial Sequence

<220>
<223> Vg1

<400> 57

Gly	Tyr	Met	Ala	Asn	Tyr	Cys	Tyr	Gly	Glu	Cys	Pro	Tyr	Pro	Leu
1				5					10					15

<210> 58
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> inhibin

<400> 58

Gly	Tyr	His	Ala	Asn	Tyr	Cys	Glu	Gly	Glu	Cys	Pro	Ser	His	Ile
1				5					10					15

<210> 59
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> TGF-beta

<400> 59

Gly	Tyr	His	Ala	Asn	Phe	Cys	Leu	Gly	Pro	Cys	Pro	Tyr	Ile	Trp
1				5					10					15

<210> 60
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> BOP

<400> 60

Lys	Arg	Ala	Cys	Cys	Val	Pro	Thr	Glu	Leu	Ser	Ala	Ile	Ser	Met	Leu
1				5					10					15	

Tyr	Leu	Asp	Glu	Asn
				20

<210> 61
<211> 20
<212> PRT
<213> Artificial Sequence

<220>

<223> Vg1

<400> 61

Leu	Pro	Cys	Cys	Val	Pro	Thr	Lys	Met	Ser	Pro	Ile	Ser	Met	Leu	Phe
1				5					10					15	

Tyr	Asp	Asn	Asn
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Lys	Ser	Cys	Cys	Val	Pro	Thr	Lys	Leu	Arg	Pro	Met	Ser	Met	Leu	Tyr
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Tyr	Asp	Asp	Gly
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Ala	Pro	Cys	Cys	Val	Pro	Gln	Ala	Leu	Glu	Pro	Leu	Pro	Ile	Val	Tyr
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Tyr	Val	Gly
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Lys	Ala	Cys	Cys	Val	Pro	Thr	Gln	Leu	Asp	Ser	Val	Ala	Met	Leu	Tyr
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Leu Asn Asp Gln
20

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Leu Tyr Val Asp Phe
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Cys Lys Arg His Pro
1 5

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Cys Arg Arg Lys Gln
1 5

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Cys Lys Arg His Glu
1 5